

The medial amygdala (MA), bed nucleus of the stria terminalis (BNST) and the medial preoptic area (MPOA) are all critical regions for the regulation of social behavior. However, the chemical nature of MA, BNST and MPOA neurons that respond to social cues are generally unknown. The present study examines the co-localization of glutamic acid decarboxylase GAD-67, the rate-limiting enzyme for GABA (the major inhibitory neurotransmitter in the brain) synthesis, with c-fos gene activity (an immediate-early gene that responds to neuronal activation) in neurons of male mice following exposure to male and female stimuli. We are testing this in a mouse strain in which the expression of green fluorescent protein (GFP) is linked to GAD-67 gene expression; this allows us to visualize GABAergic neurons across the brain and then use immunohistochemistry to stain for Fos protein (due to c-fos gene activation). The primary aim is to identify Fos/GABAergic neuron colocalization in subregions of MA (anterior, posterodorsal, posteromedial, posteroventral), BNST (posterior), and MPOA (medial preoptic nucleus, sexually-dimorphic nucleus) in response to male, female or neutral stimuli. We will also compare urine marking, ultrasonic vocalizations, and approach/investigation in this strain of mice to wild-type mice to assess if these mutant mice have normal communicative behavior. These experiments will provide critical information about the chemical identity of social-responsive neurons in the limbic brain and so will greatly increase our fine-grained understanding of social brain organization.

Keywords: medial amygdala, bed nucleus of the stria terminalis, medial preoptic area, social behavior, mice